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EXAMINER

FOX, DAVID T

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 05/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 09/701,023	<b>Applicant(s)</b> YE ET AL.	
	<b>Examiner</b> David T. Fox	<b>Art Unit</b> 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-76 is/are pending in the application.
- 4a) Of the above claim(s) 7-12, 16, 20, 24 and 28-53 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 and 2 is/are allowed.
- 6) ☒ Claim(s) 3-6, 13-15, 17-19, 21-23, 25-27, 54-57 and 59-76 is/are rejected.
- 7) ☒ Claim(s) 58 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Applicant's amendment to the specification to provide continuity to the international application is acknowledged. The amendment is acceptable and has been entered.

Claims 3, 5, 15, 19, 23, 27, 54-56, 60, and 62 (newly amended), 67-70, 72, 74 and 76 (newly submitted) are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amended and newly submitted claims are drawn to a subsequence of SEQ ID NO:1 from nucleotides 80-1024. However, the specification and figures only provide basis for a subsequence of SEQ ID NO:1 from nucleotides 81-1024. Applicant urges that Figure 2 demonstrates that the start codon in SEQ ID NO:1 begins at nucleotide 80. However, the start codon ATG begins at nucleotide 81. Nucleotide 80 is an adenine immediately preceding the ATG codon. Accordingly, the claims are directed to NEW MATTER. The amendment of claim 3 has resulted in withdrawal of its previously indicated allowable status.

Claims 18, 22-23 and 26-27 remain rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter which applicant regards as the invention, as stated on page 2 of the last Office action.

Applicant's arguments filed 01 March 2004 have been fully considered but they are not persuasive. Applicant urges that the amendments of 01 March 2004 obviate the above rejection. However, Applicant has not followed the Examiner's instructions on page 2 of the last Office action. Instead of replacing "a" with ---the--- in lines 3 or 4 of the claims as previously indicated, Applicant has replaced "the" with ---an--- or ---a--- in claims 18, 22, and 26-27. Applicant is again directed to the instructions on page 2 of the last Office action, fourth paragraph.

Claims 4-6, 54-57 and 59-62 remain, and new claims 63-76 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, as stated on page 2 of the last Office action for claims 4-6, 54-57 and 59-62.

Applicant's arguments filed 01 March 2004 have been fully considered but they are not persuasive. Applicant urges that the claim amendments, which recite the structural feature of at least 70% sequence identity as well as the functional feature of the encoded protein, meet the Written Description Requirements.

The Examiner maintains that a mere recitation of 70-90% sequence identity, in the absence of any demonstration that said variant sequences would indeed encode a protein having the claimed function, is insufficient. According to the Written Description

Guidelines and Examples appended thereto, the disclosure of a single gene sequence encoding a single protein only provides an adequate written description for claims drawn to the genus of nucleotide sequences which encode a protein having at least 95% identity to the entire protein encoded by the exemplified gene. See claim 58. In the instant case, the breadth of the claimed genus is not represented by an adequate number of species, and Applicant has not provided any demonstration of any conserved sequences (or sequences which are correlated with encoded protein function) in genes with as low as 70% sequence identity to SEQ ID NO:1 or portions thereof, which may be as little as 40-80 base pairs long.

Furthermore, claims drawn to nucleic acid sequences which are characterized only by comprising subsequences with 70%-100% sequence identity to SEQ ID NO:2 are inadequately described, since SEQ ID NO:2 is only 271 base pairs long, and clearly does not encode a functional SPOROXYTELESS protein. The presence of 40-80 base pairs with 70-100% similarity to SEQ ID NO:2, or with 70-100% similarity to 40-80 base pair portions thereof, is insufficient to characterize the remaining portion of the nucleic acid comprising it, particularly when the nucleic acid comprising it is not limited in length or when the nucleic acid is supposed to encode a large functional protein. See claims 4, 59, 61, 63-71, 73 and 75.

Similarly, inadequate written description exists for claims drawn to nucleic acid sequences which are only characterized by comprising 40-80 base pairs which are 70-100% similar to 40-80 base pairs of SEQ ID NO:1 or a 940 base pair-long fragment

thereof. The remainder of the nucleic acid is uncharacterized. See claims 5, 54-56, 60, 62, 72, 74 and 76.

Claims 4-6, 54-57 and 59-62 remain, and new claims 63-76 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for claims limited to a nucleic acid from *Arabidopsis thaliana* which comprises the SPOROCYTELESS gene comprising SEQ ID NO:1 (including the coding region from nucleotides 81-1024) or which encodes SEQ ID NO:4 or a protein with at least 95% identity thereto, does not reasonably provide enablement for claims broadly drawn to any nucleic acid from any source which has at least 70% identity to 40mer subsequences of SEQ ID NOS: 1 or 2, or which is characterized only by having at least 70%-100% identity to SEQ ID NO:2 (which itself is only 271 base pairs long). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims, as stated on pages 2-3 of the last Office action for claims 4-6, 54-57 and 59-62.

Applicant's arguments filed 01 March 2004 have been fully considered but they are not persuasive. Applicant urges that the enablement rejection regarding non-exemplified sequences is improper, given the demonstration by Meinke et al that *Arabidopsis* is a model plant species, and given the lack of applicability of the Spielman et al reference cited by the Examiner.

The Examiner maintains that Meinke et al merely teach the advantages of *Arabidopsis* in terms of its small plant size, small genome size, and short lifecycle.

However, the ease of utilizing a single species as a model system does not mean that every aspect of that species is conserved across a multitude of taxonomically and physiologically divergent species. The Examiner has already provided at least one instance where *Arabidopsis* differs from other plants, as taught by Spielman et al. See page 6 of the first Office action, first full paragraph. Contrary to Applicant's assertions, the teachings of Spielman et al are quite applicable to the instant invention, because both are drawn to the results of meiocyte formation (i.e. pollen formation). Furthermore, Spielman et al teach the general lack of knowledge regarding meiocyte production in flowering plants, as stated in the excerpted portion of the first Office action. Finally, Meinke et al support the Examiner's position in their statement that the use of *Arabidopsis* as a model system is still in its infancy (see, e.g., page 681, bottom paragraph of column 2).

Claims 13-15, 17-19, 21-23 and 25-27 remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, as stated on page 3 of the last Office action.

Applicant's arguments filed 01 March 2004 have been fully considered but they are not persuasive. Applicant urges that Schiefthaler et al cited by the Examiner in fact teaches successful plant transformation with the SPOROCTELESS gene, thus refuting his position. Applicant further urges that Matsuoka et al cited by the Examiner is inapplicable, since it deals with a developmental protein of a different class from

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Applicant's. Applicant further urges that the specification provides guidance regarding methods of plant transformation.

The Examiner respectfully submits that Schiefthaler et al nowhere teaches plant transformation with an entire SPOROCTELESS gene, or the obtention of seedless fruits or pollenless flowers as claimed. Schiefthaler et al simply teaches the use of transposon tagging to generate mutants of the SPOROCTELESS gene in order to facilitate its cloning.

Regarding Matsuoka et al, the Examiner maintains that the reference demonstrates the general unpredictability inherent in plant transformation with genes encoding developmental proteins. As Applicant has not demonstrated even a single example of successful plant transformation with their particular gene, followed by the obtention of the desired pollenless or seedless phenotype, Applicant's mere assertions are insufficient to overcome the evidence submitted by the Examiner. Furthermore, Applicant's broadly claimed genus of sequences encompasses the gene taught by Matsuoka et al.

Regarding the teaching in the specification of methods of plant transformation, the Examiner maintains that Applicant has not taught any *method of using* said transformed plants of claims 13-15, 17-19 and 21-23; since no transformed plant was reduced to practice, and since the obtention of the desired phenotypes recited in claims 25-27 is unpredictable, as stated above and previously.



Claim 5 remains, and new claims 72, 74 and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by Rounsley et al (Accession No. B67977 published 09 December 1997), as stated on pages 3-4 of the last Office action for claims 4-5.

Applicant's arguments filed 01 March 2004 have been fully considered but they are not persuasive. Applicant urges that Rounsley et al merely teach an expressed sequence tag rather than a nucleic acid sequence which encodes an entire SPOROCTELESS protein.

In response to Applicant's arguments, the Examiner has withdrawn claim 4 from this rejection. However, claim 5 and dependents are not drawn to a nucleic acid that encodes an entire SPOROCTELESS protein. Instead, these claims are drawn to 40-80mer portions of said genes or degenerate variants of said 40-80mer portions, which portions are clearly taught by Rounsley et al, as stated in the last Office action.

Claims 4-5, 54-56 and 59-62 remain, and new claims 63-65 and 67-69 are rejected under 35 U.S.C. 102(b) as being anticipated by Weigel et al, as stated on page 4 of the last Office action for claims 4-5, 54-56 and 59-62.

Claims 4-5, 54-56 and 59-62 remain, and new claims 63-65 and 67-69 are rejected under 35 U.S.C. 102(b) as being anticipated by Pnueli et al, as stated on page 4 of the last Office action for claims 4-5, 54-56 and 59-62.

Applicant's arguments filed 01 March 2004 have been fully considered but they are not persuasive. Applicant urges that the above two art rejections are improper, given the amendment of the claims to recite 70% sequence identity, and the failure of the cited references to teach genes encoding a protein involved in meiocyte formation.

The Examiner maintains that the claims do not recite 70% sequence identity over the entire length of the gene or its coding sequence, as stated above. Instead, the claims are drawn to nucleic acids which merely comprise 40-80mer portions which have 70% sequence similarity to SEQ ID NO:1 or 2 or which have 70% sequence similarity to 40-80mer portions of SEQ ID NO:1 or 2, and which are otherwise uncharacterized. Claims 5 and 54-56 are drawn to nucleic acids which are characterized only by having 70-98% identity to 40mer portions of SEQ ID NO:1 or 70-98% sequence identity to sequence variants of SEQ ID NO:1. Claims 4, 63-65 and 67-69 are drawn to nucleic acids which are characterized only by having 70-90% identity to the 271bp sequence of SEQ ID NO:2, but are otherwise uncharacterized.

Regarding the encoded protein, the Examiner maintains that claims 5 and dependents do not recite a nucleic acid which encodes an entire meiocyte-forming protein. Furthermore, the homeotic nature of the proteins encoded by the genes taught by Weigel et al and Pnueli et al implies that these proteins are also involved in meiocyte formation, either directly or indirectly. Any gene involved in flower structure is at least indirectly involved in meiocyte formation. Applicant's arguments that the genes taught by Weigel et al and Pnueli et al, which are clearly encompassed by the broadly claimed genus of sequence variants, do not in fact encode meiocyte-formation proteins, contradict Applicant's arguments that the broadly claimed genus of sequences is adequately described and enabled.

Claims 1-3, 6, 13-15, 17-19, 21-23, 25-27 and 57-58 remain free of the prior art, as stated on page 4 of the last Office action. New claims 66, 70-71, 73 and 75 are

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deemed free of the prior art, given the failure of the prior art to teach or suggest isolated nucleic acid molecules with 95-100% sequence identity to entire SEQ ID NOS: 1 or 2, or nucleic acid sequences encoding meiocyte formation proteins and comprising subsequences with 95-100% sequence identity to 40-80mer portions of SEQ ID NO: 2.

Claim 58 remains objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-2 remain allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David T. Fox whose telephone number is (571) 272-0795. The examiner can normally be reached on Monday through Friday from 10:30AM to 7:00PM.

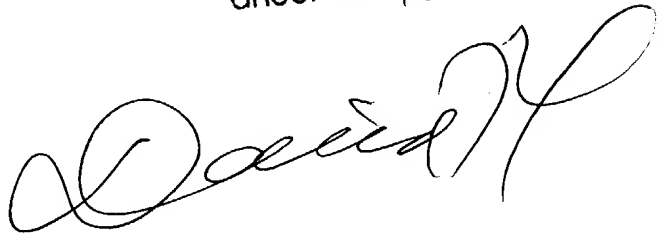
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached on (571) 272-0804. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

May 14, 2004

DAVID T. FOX  
PRIMARY EXAMINER  
GROUP 180 1638

A handwritten signature in cursive script, appearing to read "David T. Fox", written in black ink.